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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re Application of: Rämö et al. : Attorney Docket No.: 944-003.182
Serial No.: 10/692,290 : Examiner: Michael N. Opsasnick
Filed: October 23, 2003 : Art Unit: 2626

For: METHOD AND SYSTEM FOR SPEECH CODING

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

This Request for Pre-Appeal Brief for Review is filed in response to the final office action, mailed September 8, 2008.

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REMARKS

This Request for Pre-Appeal Brief for Review is filed along with a Notice of Appeal appealing the rejection of claims 1 and 3-48.

It is respectfully submitted that, the claimed invention is concerned with the segmenting of an audio signal into a plurality of segments based on audio characteristics of the audio signal, wherein the audio characteristics indicative of parameters in a parametric representation (Independent claims 1, 19, 22, 27 and 31). The characteristics include voicing characteristics, energy characteristics, pitch characteristics (dependent claims 3, 4, 5, 8, 9, 11, 12, 14, 15, 16, 17, 18). The parameters include frequency values, amplitude values, phase values (claim 34); pitch, voicing, amplitude and energy (claim 35); pitch contour data (claim 36). The segmentation can also be based on a selected quantization mode for bit allocation and parameter update rate reduction (claim 12), or based on a selected target accuracy (claim 13). The segmentation can also be used in conjunction with an adaptive downsampling scheme (claims 15, 16, 17, 18). The claimed invention is also concerned with encoding the segments with different coding settings (claims 1, 33, 37, 22, 39, 40). The segments comprise segments of different lengths (claims 42, 44-48).

A. Extraction of Speech Parameters and Segmentation of Audio Signal

In the specification, parameters 112 are extracted and provided by an encoder 12, and segmentation of the audio signal is carried out by a compression module 20 based on the parameters (Figure 4; p.13, lines 8-11, lines 21-24). The compression module 20 can be used to carry out the following steps based on the behavior of the parameters: 1. Segmentation of the input signal; 2. Defining optimal parameter update rate for different segments and parameter; 3. Decimation of transmission parameter; and 4. Efficient quantization of the derived parameters (p.13, lines 21-28).

B. Adaptive Downsampling and Quantization

According to the present invention, the segmentation can also be used in conjunction with an adaptive downsampling and quantization scheme, but the process containing segmentation and adaptive downsampling with quantization is carried out in two phases (p.14, lines 15-22). The first phase is segmentation phase where a stream of consecutive frames is divided into a

plurality of continuous segments (p.14, line 22). The second phase is quatization of a segment (parameters in a parametric representation) using adaptive downsampling (p.14, lines 24-26).

After the stream of consecutive frames is divided into a plurality of continuous segments, optimization can be performed locally on one segment at a time (p.14, lines 17-19). The segment can be read by a typical encoder in order to estimate the parameters in that segment at regular intervals (frames) (p.14, lines 19-20; Figure 7, steps 510 and 512; p.15, lines 10-12). Based on the estimated parameters, the compression module gathers together all k parameter values inside the segment in order to form a segmented parameter signal from the successive parameter values (p.14, lines 27-29; Figure 7, step 513; p.15, lines 12-13). A quantization mode is selected from the voicing values inside the segment (p.14, lines 19-30; Figure 7, step 514; p.15, lines 13-14). It is followed that the target accuracy is defined for the coded parametric representation and the number of bits for quantization is determined.

Thus, in the invention as described on p.13 to p.15 and illustrated in Figures 4, 5 and 7, the compression module 20 is used for segmentation of an audio signal as well as forming segmented parameter signal based on the parameters provided by an encoder. The encoder 12 as shown in Figure 4 is only used for extracting parameters.

C. 112 Rejection

At section 2 of the final office action, claims 1, 3-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that claims 1, 19, 22, 27, 31 and 32 have the limitation of segmenting audio signals based upon audio characteristics, but it is not clear as to which segmenting aspect of the disclosure this refers. The Examiner further states that the specification discloses two aspects of segmenting: 1) the sub-block 12 in Figure 4, based on the input speech signal 110, generates segmented audio with associated parameters 112, and 2) the sub-block 20 segments the audio signal based on degree of voicing, etc.

As shown in Sections A and B above, the segmentation of the audio signal is only carried out by the compression module 20 although the compression module can also be used to form a segmented parameter signal for adaptive downsampling. The sub-block 12 in Figure 4 is a parameter extraction unit which is only used to **extract** unquantized parameters from the input

speech signal 110 and provides the extracted parameters 112 to the compression module 20 (Figure 4; p.13, lines 8-13). The extracted parameters include linear prediction coefficients, speech energy (gain), pitch and voicing information (p.11, lines 24-25).

Segmentation means sectioning, partitioning or dividing. There is no indication in the disclosure that the parameter extraction unit 12 is used to partition or divide the input speech signal into separated segments through the parameter extraction process, although parameter estimation can be carried out in regular intervals (frame).

For the above reasons, applicant respectfully requests that the Examiner withdraw the 112 rejection.

D. 102(b) Rejection

At section 3, claims 1, 3-14, 19-21, 26-37, 39-44 and 46-48 are rejected under 102(b) as being anticipated by *Gersho et al.* (U.S. Patent No. 6,311,154, hereafter referred to as *Gersho*). The Examiner states that *Gersho* discloses segmenting {partitioning or classifying} the audio input signal into a plurality of segments {frames} based on the audio characteristics {classes} of the audio signal. The Examiner points to col.4, lines 25-27 to show that *Gersho* discloses classifying the frames in the speech signal into one of the plurality of classes.

The Examiner errs in two aspects: 1) classifying is not the same as segmenting or partitioning; and 2) *Gersho* classifies each of the frames into classes only after segmenting or partitioning the speech signal into frames (col.4, lines 23-34).

As applicant pointed out in the Request for Reconsideration (p.4, lines 9-28), according to *Gersho*, class information is not available before the speech signal is segmented or partitioned into frames. Even in the conventional AbS schemes, excitation is searched after the speech signal is segmented into frames and into sub-frames. *Gersho* does not disclose segmenting the input speech signal into segments based on audio characteristics (classes).

In contrast, the claimed invention is concerned with segmenting (partitioning) an audio signal into a plurality of segments based on audio characteristics of the audio signal, the audio characteristics indicative of parameters in a parametric representation of the audio signal.

Gersho does not disclose segmenting the input speech signal into segments based on the audio characteristics of the audio signal.

For the above reasons, *Gersho* fails to anticipate independent claims 1, 19, 27 and 31.

As for claims 3-14, 20-21, 26, 28-30, 33-37, 39-44 and 46-48, they are dependent from claims 1, 19, 27 and 31. For reasons regarding claims 1, 19, 27 and 31 above, claims 3-14, 20-21, 26, 28-30, 33-37, 39-44 and 46-48 are also distinguishable over *Gersho*.

E. 102(e) Rejection

At section 5, claims 15-18, 22-25, 38 and 45 are rejected under 102(e) as being anticipated by *Sinha et al.* (U.S. Patent No. 7,191,136 B2, hereafter referred to as *Sinha*). In rejecting those claims, the Examiner states that *Sinha* discloses segmenting the audio signal into a plurality of segments based on audio characteristics of the audio signal (by high pass filtering the input audio signal (col. 4, lines 47-51) and then performing a non-linear parametric representation of the signal (col. 4, lines 53-59).

As applicant pointed out in the Request for Reconsideration (p.4, line 23 to p.5, line 13; p.5, lines 15-26), claims 15-18 are dependent from claim 1 which includes the limitation that the input audio signal is segmented based on audio characteristics indicative of parameters in a parametric representation. *Sinha* does not disclose or suggest that the input audio signal is segmented based on audio characteristics indicative of parameters in a parametric representation.

Sinha fails to anticipate claims 15-18, 22-25, 38 and 45.

F. Conclusion

The cited *Gersho* and *Sinha* references fail to anticipate claims 1, 3-48.

Respectfully submitted,



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